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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/634,867 | 08/06/2003 | Hyang-Shik Kong | 6192.0157.D1 | 7649 |

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04/08/2004

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| EXAMINER |
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DUONG, KHANH B

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| ART UNIT | PAPER NUMBER |
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2822

DATE MAILED: 04/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/634,867

Applicant(s)

KONG ET AL.

Examiner

Khanh Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2003.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 13-33 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7 and 13-33 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/837,374.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This Office Action is in response to the Preliminary Amendment filed on August 6, 2003.

Accordingly, claims 8-12 and 34-41 were canceled.

Currently, claims 1-7 and 13-33 are pending in the application.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/837,374 filed on April 19, 2001.

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the mailing address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

Specification

The abstract of the disclosure is objected to because: line 4, after "a semiconductor layer", --and-- should be inserted. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claims 2, 4, 13, 14, 17, 23 and 27 are objected to because of the following informalities:

Re claims 2, 14 and 23, "nitride silicon" should be --silicon nitride--.

Re claim 4, line 2, "minute" should be plural form --minutes--.

Re claim 13, line 9, "the wire" is unclear and should be --the gate wire--.

Re claim 17, line 2, "at%" should be --%--.

Re claim 27, line 2, "after "thicker", "larger" is redundant and should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 31-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 31, it is unclear how "the thickness of the first portion is less than the half of the thickness of the second portion" since the instant claim depends on claim 27 which recites "a second portion having a second thickness thicker larger than the first portion". Claims 32 and 33 are rejected as depending on the rejected base claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1, 2, 6, 7, 13, 14, 18-21, 23 and 26-33 are rejected as understood under 35

U.S.C. 102(e) as being anticipated by Park et al. (US 6,287,899).

Re claims 1 and 2, Park et al. ("Park"), submitted by applicant in IDS dated August 6, 2003, discloses in FIGs. 3-5, 13 and 15 a method for manufacturing a contact structure of a wire 22, comprising steps of: forming a wire 22 made of aluminum-based material; depositing an insulating layer (30 and 70) covering the wire 22; patterning the insulating layer (30 and 70, both of silicon nitride) to form a contact hole 74 exposing the wire 22 (at portion 24); and forming a conductive layer 84 made of indium zinc oxide (IZO) and electrically connected to the wire 22 (at portion 24) [see col. 9, ln. 36-41, 66 and 67; col. 10, ln. 38-45; col. 16, ln. 3-5].

Re claims 6 and 7, since the contact structure of the wire of Park et al. are formed of the same materials as the claimed invention, it should be inherent that the contact resistance of the aluminum-based material and the indium zinc oxide is less than 10% of wire resistance of the wire or less than $0.15 \mu\Omega\text{cm}^2$.

Re claims 13 and 14, Park discloses in FIGs. 3-5, 13 and 15 a method for manufacturing a thin film transistor array panel, comprising steps of: forming a gate wire 22 including a gate pad 24 by depositing and patterning an aluminum-based material; forming a gate insulating layer (30 and 70, both of nitride) covering the gate wire 22; forming a semiconductor layer 42;

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forming a data wire 66; forming a contact hole 74 exposing the gate pad 24 by patterning the gate insulating layer (30 and 70); and forming a conductive layer 84 electrically connected to the wire 22 by depositing and patterning indium zinc oxide (IZO) [see col. 9, ln. 36-41, 66 and 67; col. 10, ln. 38-45; col. 16, ln. 3-5].

Re claim 18, Park expressly discloses in FIG. 5 forming a pixel electrode 87 connected to the data wire 66 when forming the conductive layer 84.

Re claims 19 and 23, Park discloses in FIGs. 3-5, 13 and 15 a method for manufacturing a thin film transistor array panel for a liquid crystal display, comprising steps of: forming a gate wire including a gate line 22, a gate electrode 26 connected to the gate line 22 and a gate pad 24 connected to the gate line 22, and made of aluminum-based material on an insulating substrate 10; depositing a gate insulating layer 30 (silicon nitride); forming a semiconductor layer 42; forming a data wire including a data line 62 intersecting the gate line 22, a source electrode 65 connected to the data line 62 and adjacent to the gate electrode 26 and a drain electrode 66 opposite to the source electrode 65 with respect to the gate electrode 26 by depositing and patterning a conductive layer; depositing a passivation layer 70 (silicon nitride); patterning the passivation layer 70 along with the gate insulating layer 30 to form a contact hole 74 exposing the gate pad 24; and forming a redundant gate pad 84 connected to the gate pad 24 through the contact hole 74 by depositing and patterning IZO.

Re claim 20, Park expressly discloses in FIG. 3 forming a pixel electrode 87 connected to the drain electrode 66 when forming the redundant gate pad 84.

Re claim 21, Park expressly discloses in FIG. 4 the data wire further comprises a data pad 64 connected to the data line 62, a redundant data pad 86 connected to the data pad 64 when forming the redundant gate pad 84.

Re claims 26-33, Park expressly discloses in FIGs. 31B-33: data wire 60 and the semiconductor layer 40 are together formed by a photolithography process using a photoresist pattern 100 having different thicknesses depending on the positions, wherein the photoresist pattern 100 has a first portion having a first thickness, a second portion having a second thickness thicker than the first portion, and a third portion having a third thickness thinner than the first thickness; a mask 200 being used for forming the photoresist pattern 100 has a first, a second, and a third part, a transmittance of the third part is higher than the first part and the second part, a transmittance of the first part is higher than the second part; the first portion and the second portion of the photoresist pattern 100 are respectively aligned on portion between the source electrode 65 and the drain electrode 66, and the data wire 60; the first part of the mask 200 includes a partially transparent layer, or a pattern smaller than the resolution of the exposure used in the exposing step, to regulate the transmittance of the first part; depositing an ohmic contact layer 50 between the data wire 60 and the semiconductor layer 40, wherein the data wire 60, the ohmic contact layer 50, and the semiconductor layer 40 are formed in the same photolithography process.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

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to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3, 4, 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park in view of Fogarty et al. (US 4,181,564).

Re claims 3, 4, 15 and 22 Park fails to disclose the deposition conditions for the silicon nitride insulating layer at a temperature in the range of 280-400°C for a period in the range of 5-40 minutes.

Fogarty et al. ("Fogarty") suggests forming a silicon nitride layer at a temperature in the range of 270-375°C for a period in the range of about 45 minutes [see col. 2, ln. 65 to col. 3, ln. 3 and col. 4, ln. 35-55].

Since Park and Fogarty are both from the same field of endeavor, the purpose disclosed by Fogarty would have been recognized in the pertinent prior art of Park.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Park as suggested by Fogarty, since Fogarty states at column 4, lines 26-29 such modification would provide a silicon nitride layer having an essentially constant Si/N ratio throughout the thickness of the layer.

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Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a temperature and time within the ranges as taught by Fogarty, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Park.

Re claims 5, Park fails to disclose the contact hole is more than 0.5 mm x 15 μ m and less than 2 mm x 60 μ m.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the size of the contact hole within the range as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claims 16, 17, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park in view of Arai et al. (US 6,399,222).

Re claims 16, 17, 24 and 25, Park fails to disclose the indium zinc oxide is formed by sputtering target including In_2O_3 and ZnO , wherein the content of Zn in a compound of In_2O_3 and ZnO is in the range of 15-20%.

Arai et al. ("Arai") suggests the indium zinc oxide is preferably formed by sputtering target including In_2O_3 and ZnO , wherein the content of Zn in a compound of In_2O_3 and ZnO is in the range of 1-20% [see col. 4, ln. 22-32].

Since Park and Arai are both from the same field of endeavor, the purpose disclosed by Arai would have been recognized in the pertinent prior art of Park.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Park as suggested by Arai, since Arai states at column 4, lines 47-49 that such modification would provide an electrode layer having a sufficient thickness.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the content of Zn in a compound of In_2O_3 and ZnO within the range as taught by Arai, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

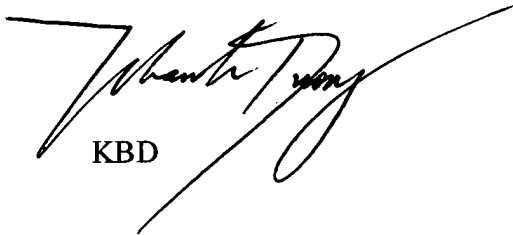
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on Monday - Thursday (9:00 AM - 6:00 PM).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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